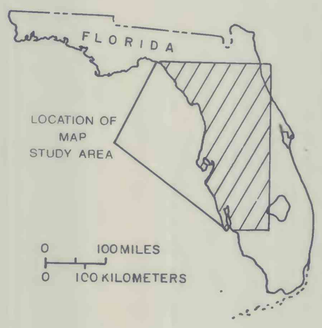
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

OPEN-FILE REPORT 90-133



INTRODUCTION

The potentiometric surface is an imaginary pressure surface represented by the level to which water will rise in tightly cased wells that tap a confined aquifer. The potentiometric surface of the Upper Floridan aquifer is mapped by determining the altitude of water levels in a network of wells and is represented on maps by contours that connect points of equal altitude. Maps of the potentiometric surface of the Upper Floridan aquifer in west-central Florida are prepared semiannually by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District. Maps for May and September show the potentiometric surface of the normally expected annual low and high water-level conditions, respectively. Potentiometric-surface maps have been prepared for January 1964, May 1969, May 1971 to 1974, and for each May and September since 1975.

This report shows the potentiometric surface of the Upper Floridan aquifer for September 1989. Most of the water-level data were collected by the U.S. Geological Survey during the period of September 11-15. Supplemental data were collected by other agencies and companies. This map represents water-level conditions near the end of the summer rainy season when ground-water withdrawals for agricultural use are low. Rainfall was below normal for the 1989 water year prior to the September water-level measurements and, therefore, the potentiometric surface shown on this map may not represent the highest water levels for the year.

SUMMARY OF CONDITIONS

Annual and seasonal fluctuations of the potentiometric surface at selected wells are shown by hydrographs in figure 1. The hydrographs generally indicate that water levels in latitudes north of the Hillsborough-Pasco County line (northern area), where ground-water withdrawal usually is moderate, remain fairly uniform from year to year and seasonally, whereas water levels south of the county line (southern area), where withdrawal is substantially greater, show large year to year and seasonal fluctuations. Daily maximum water levels for selected wells from September 1988 to September 1989 are shown in figure 2.

Water levels in most wells measured in September 1989 were higher than those measured in May 1989 (Barr, 1989), except in areas of Pasco County. September water levels averaged about 1 foot higher than May levels in the northern area and about 20 feet higher in the southern area. In the southern area, rises in water levels were about 10 feet or less along coastal and extreme southern regions and about 40 feet in other southern areas. The largest fluctuation of water levels occurred in southern Hillsborough and central Manatee Counties as a result of recharge during the rainy season and reduced irrigation pumpage in the summer.

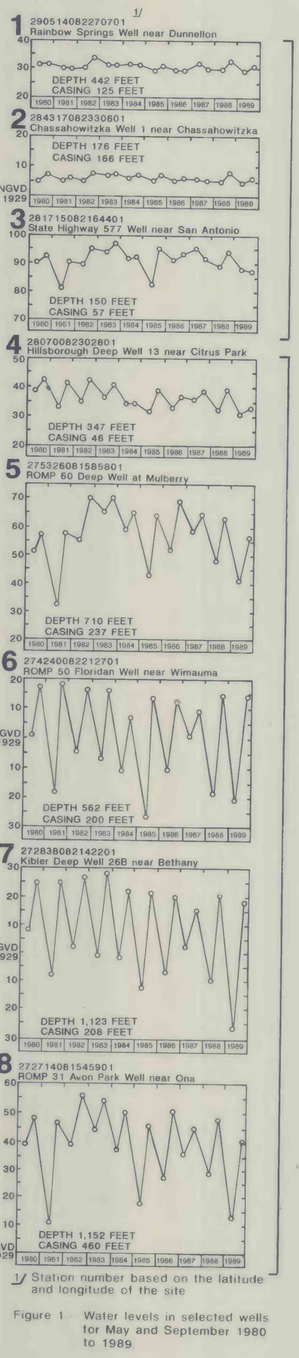
Water levels measured in September 1989 and shown in this report averaged about 4 feet lower than water levels measured in September 1988 (Barr, 1988). The decline in water levels during this period was caused largely by below normal rainfall and reduced recharge to the aquifer from September 1988 through September 1989.

SELECTED REFERENCES

Barr, G.L., 1988, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, September 1988: U.S. Geological Survey Open-File Report 88-730, 1 sheet.

----- 1989, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 1989: U.S. Geological Survey Open-File Report 89-393, 1 sheet.

Southwest Florida Water Management District, 1989, Summary of hydrologic conditions, September 1989: 55 p.



1/ Station number based on the latitude and longitude of the site

Figure 1 -- Water levels in selected wells for May and September 1980 to 1989.

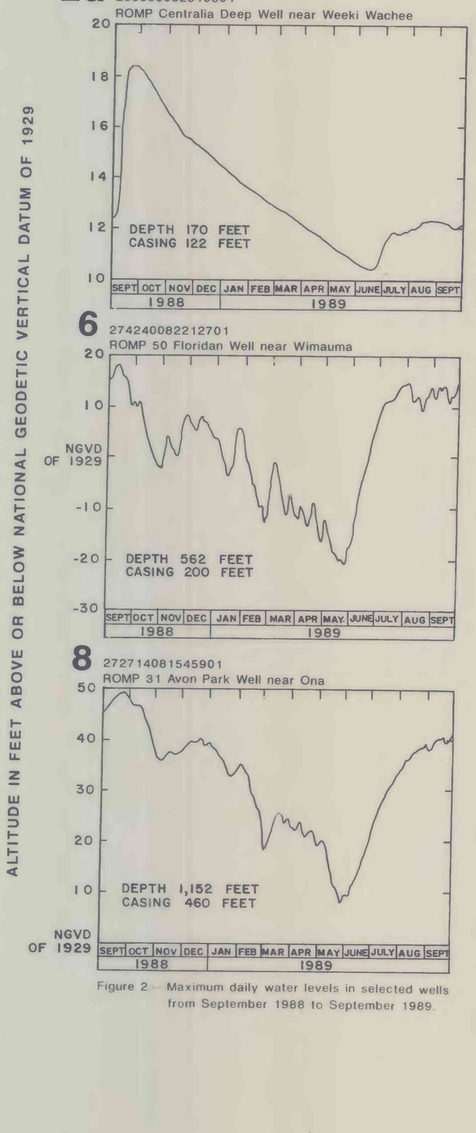


Figure 2 -- Maximum daily water levels in selected wells from September 1988 to September 1989.

EXPLANATION

50 -- POTENTIOMETRIC CONTOUR--Shows altitude at which water level would have stood in tightly cased wells. Contour interval 5 and 10 feet. National Geodetic Vertical Datum of 1929 (NGVD of 1929). Hachures indicate depressions. Dashed where approximate

8 31 / 32 -- OBSERVATION WELLS--Large number and symbol identifies hydrograph (fig. 1). Small number is altitude of water level in feet above or below NGVD of 1929

BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

BOUNDARY OF WATER MANAGEMENT BASIN

NOTE: The potentiometric contours are generalized to portray synoptically the head in a dynamic hydrologic system, taking due account of the variations in hydrogeologic conditions, such as differing depths of wells, nonsimultaneous measurements of water levels, variable effects of pumping, and changing climatic influence. The potentiometric contours thus may not conform exactly with individual measurements of water level

SCALE 1:500,000
0 10 20 MILES
0 10 20 KILOMETERS

Base from U. S. Geological Survey
State of Florida map 1967 1:500 000

POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA, SEPTEMBER 1989

By L.A. Knochenmus and G.L. Barr

Copies of this map can be purchased from
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